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ABSTRACT

Tested with 31 students (kindergarten through grade 5) who manifested poor and inappropriate classroom behaviors was a combination of direct intervention strategy for behavior modification and provision of a maintenance program for the classroom teacher. Strategies included the use of observation and introduction procedures; and direct intervention through use of a workbox, a countoon (a cartoon picture sequence of the child's behavior), and a contract with the student. Analysis of observation data in baseline, intervention, generalization across conditions, and generalization over time indicated significant behavior change for each component over baseline. (IM)

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A Direct Intervention Replication

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A Direct Intervention Replication

A replication of the Patterson direct intervention strategy was carried out as the motivation component of a special project. Generalization of the effect was planned for by providing the classroom teacher with a maintenance program as a second stage. The effectiveness of this combination of direct intervention and maintenance was evaluated by gathering observation data in baseline, intervention, generalization across conditions, and generalization over time. A one-way analysis of variance indicated significant behavior change for each component over baseline.

Teacher response to proposed operant strategies is often unfavorable. The reason for this seems to be that the teacher is asked to use procedures with which he is unfamiliar, and to expend considerable effort with only assurances that student change will occur. Quite often, these assurances are not sufficiently reinforcing to carry the teacher through the program initiation stage, and the program is consequently never fully established. Even when teachers do begin programs which would bring one or a number of student behaviors under control, they often fail to operate the programs long enough to bring about significant changes in the student's behavior. Because of these difficulties, a strategy developed by Gerald Patterson (Patterson, Cobb and Ray, 1972) for use with aggressive children was adapted to the needs of Project AIMS. * The strategy presented in this paper is a replication of work initially carried out by Patterson et al. The workbox procedure, however, is the only procedure used in both the Patterson study and in this current study. The additional procedures cited in this paper were either developed locally or adopted from other sources. The benefits of the Patterson direct intervention strategy were that it required little teacher effort until the program had been implemented and significant student behavior change had been brought about. Only after each of the procedures had produced demonstrable behavior change was the teacher asked to become involved in the program. The teacher carried out a maintenance program, rather than a behavior change program. This maintenance program was designed to continue the level of reinforcement so the student would continue to respond at the low levels of inappropriate behavior produced by the change program.

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Method

Subjects

Thirty-one students in kindergarten through fifth grade received direct interventions. These students were referred by classroom teachers for poor classroom behaviors. These behaviors included disruption, aggression, and poor work skills. These students' high levels of inappropriate behaviors were confirmed by the AIMS observation procedure.

Observation Procedures

The observation procedures used were similar to the ones developed by Cobb and Ray as cited by Patterson et al (1972). Observations were on students referred for high levels of inappropriate classroom behavior by teachers, parents, and principals. Upon receipt of the referral, and after signed parental approval had been obtained, five observations were conducted over five class days. This allowed the comparison of subject percent inappropriate behavior with peer percent inappropriate. Students had a program designed for them when they exceeded their classroom percentage of inappropriate behavior by ten percentage points. No attempt was made to fix a single percentage of inappropriate behavior for different classes or teachers, because this percent figure varied widely from classroom to classroom, with a range from about 5% to 30%. A program was designed which used the highest frequency inappropriate behaviors as targets for interventions.

Observations during the intervention were carried out by a second observer to determine the program's effectiveness. Follow-up observations assessed durability of the programs. Two follow-up observations were conducted during the first week following termination of the intervention, and one during the second week. Generalization of intervention effects across the subject areas,

or class periods, was assessed by concurrent observation probes in different class periods from that in which the interventions took place. Each target student was also observed at the end of the year over five consecutive school days. Procedures were devised to allow this check on program effectiveness across courses or class periods and over time, since behavior change which is maintained only while the behavior modifier is present is of little value to the teacher or student.

Observer reliability was achieved by a two-hour training session using video tape. A 30-minute taping of a classroom was used for this training session. Inter-observer reliability among the four observers exceeded 90% by the completion of the two-hour training period. Two observers scored the same student to periodically check on observer reliability. The 90% level of inter-observer reliability was consistently exceeded during these checks. A movie was also developed which introduced new observers to the behavior code and simulated one classroom observation period. Although some difficulty was anticipated from using the Patterson observation code with its 19 different behavior categories, high reliability percentages were obtained from four people with diverse educational backgrounds.

Introduction Procedure

A standard introduction procedure was used with all behavior modificiation procedures in Project AIMS. It was used with the countoon procedure, the workbox procedure, and the contract procedure. The procedure was:

The behavior modifier entered the room. The teacher introduced him to the class. The behavior modifier said, "The teacher has allowed me to perform an experiment in your class." He held up the workbox, countoon, or contract, and said, "This is a workbox (contract, countoon). I need a volunteer to work with,

who would like to do it?" He then said to the preselected student, "You, there, what's your name? How about you?" If the preselected student did not volunteer, he was picked as if he did volunteer, using the same method. If the student was still resistant, a student near him was chosen. The behavior modifier then used the procedure in view of the first student to desensitize him. This was necessary on only one occasion, and the preselected studert requested the workbox the next day.

Direct Intervention

Workbox. The workbox is a hand calculator which has been modified to accept a remote control switch. It was designed by Dr. Sam Sparks of Sensory Engineering in Seattle, Washington, for Project AIMS. Its utility is in the immediate feedback it provides to a student. Its design is similar to the Patterson workbox (Patterson et al). The procedure we used for its operation was as follows:

The subject was asked to choose from a menu (Table 1) the backup reinforcer he would work toward.

Insert Table 1 about here

The workbox was then placed on the subject's desk. The subject was shown the window in which he could see the number of points he had accumulated. The subject was also given a brief introduction as to how he could earn points. "Every once in a while, if you are studying (or following in your book, or listening to the teacher), I will push the button and you will get a point. If you work all through the time I am here, you can earn 30 points. Let's see how many you can earn." Occasionally, the reminder was given to "remember,

when you look around or talk to your neighbor, I turn off the clock and you can't earn any more points". A point was given to the subject providing he made no inappropriate responses during the time interval. This was a variable interval reinforcement schedule, with a mean interval of 60 seconds (VI60") and a range from 15 seconds to 90 seconds. If the subject made an inappropriate response, that interval was reset. The timer was restarted only after the subject ceased making the inappropriate response. An inappropriate response was recorded only if its duration was longer than two seconds. A second inappropriate response was counted if the response was longer than eight seconds. These steps were taken so that our intervention procedure would coincide with our observation procedure, which used six-second intervals. In the procedure, the response that occupied the majority of the six-second interval (three seconds or more) was recorded (Patterson et al).

Fixed interval omission training. The fixed interval omission procedure was used in Project AIMS with younger children in kindergarten and first grade. It was thought that younger children need the immediate reinforcement that this procedure offers, and the more public display. The procedure was as follows:

The modifier took the subject aside and said, "For every minute that you don't do _____ (specify behavior appropriate to the subject), I will put a mark on the board under the heading 'good'." The modifier then wrote on the board,in a place clearly visible to all the students, the subject's name. Under this, he put the words "good" and "not". "If you do _____ (specified above behavior), you will get a mark under 'good'. If you do _____ (specified above inappropriate behavior), you will get a mark under 'not'. If you get five or fewer marks under 'not', you will get your choice of rewards from this menu. If you get more than five 'not' marks, you won't get the reward.

You can go back to class now." The modifier then observed the subject and implemented the procedures cited above for a 30-minute session. If the subject had five or fewer "not" marks at the end of the period, he received his reward. This reward was usually some free-time activity. His marks were left on the board for the remainder of the school day.

Countoon. The countoon was used as both a direct intervention and a maintenance program. During the first stage, the behavior modifier implemented the procedure. During the maintenance stage, it was teacher-controlled. The countoon is a pre-made handout modeled after the countoon section from Harold Kunzelman et al, Precision Teaching (1970). A countoon is simply a cartoon three-picture sequence of the child's behavior. Following the three-picture sequence is a frame and a consequence, or what happens, frame. The countoon has good utility in helping the student learn to monitor his own behavior. The procedure we used was as follows:

The behavior modifier asked for questions from the class as to what the countoon did. After all questions had been answered, the procedure for the intervention was effected.

The countoon was taped to the subject's desk. The behavior modifier said to the subject, "This is a countoon. The first picture shows you doing what you are supposed to be doing (or aren't supposed to do). It is _____. The second picture shows what you are supposed to count. The third picture is the same as the first. Every time you do what is in the center picture, you will circle a number. If you get less than ____ (for decrease), or more than ____ (for increase), you will get your choice of rewards from this menu. I will come for half an hour each day this week and help you mark. After that, the teacher will remind you." The behavior modifier recorded behaviors with the

subjects for 30 minutes per day for one week, or until 80% agreement was reached on the count between the subject and the behavior modifier. Points were given to the subject for decreases in inappropriate behavior, increases in appropriate behavior, and for agreement with the observer at 80% or more. This final item was included to ensure that the subjects would learn to accurately monitor and record their own behaviors. Each subject was able to meet the 80% observer reliability objective within a few days.

Maintenance Procedures

Countoon. During maintenance, the teacher would periodically count the subjects' behaviors and reinforce for meeting the 80% criterion. This occasional teacher check served to produce an intermittent schedule of reinforcement. This intermittent schedule of reinforcement placed under teacher control had two purposes. The first was to produce student behavior that would endure during the intervals, which quite often stretched to days, during which the teacher did not make an observer reliability check. By having the teacher dispense the reinforcers in this second, maintenance stage of the program, the student could be expected to come under positive stimulus control in any setting in which the teacher was present. With the teacher making the observational checks and dispensing reinforcers in several different class periods and settings during the school day, generalization from the single class period in which the behavior modifier carried out the initial behavior change program to each of the other settings in which the teacher carried out the maintenance program was expected.

Contract. The previously described introduction procedure was also used with the contract procedure. Contracting (Table 2) was used with older students, and was the second, or maintenance, step in a student's program.

The contract procedure was as follows:

Insert Table 2 about here

The behavior modifier took the subject aside and negotiated each clause. Together, the subject and the modifier filled in the blanks on the self-contract form. This form included blanks for goals, an agreement for self and others (behavior modifier, parent, teacher). There were also blanks for consequences provided by self and provided by others. The contract was then signed to make it official. Signature blocks were provided for the subject, the behavior modifier, the teacher, parent, and principal. The behavior modifier then asked for questions from the class as to what the contract did, and how it operated. After all questions had been answered, the procedure for the intervention was effected.

If a room had a second referral, the behavior modifier announced that the experiment was continuing, and requested new volunteers.

Results

The effect of the intervention procedures on target subjects was evaluated by comparing subjects' and peers' behavior.

At the beginning of the project year, a mean percent of inappropriate peer responding was computed. This computation with only 25 pieces of observation data indicated a mean of 15%. This level of inappropriate behavior was used as a goal for target subjects. Any target subject whose mean percent of inappropriate behavior was less than 15% was defined as remediated, since he was on task at least as much as his classroom peers. A re-computation of peer inappropriate responding at the end of the year indicated that this percentage

was fairly accurate, as the mean percent dropped only slightly, to 14.1%, with 387 pieces of observational data.

Table 3 shows the mean percentages of inappropriate behavior in each of the observed conditions for the 31 subjects involved in the program. Table 3A is a graphic display of the same data.

Insert Tables 3 and 3A about here

Column 1 shows the procedures effected with each subject. Column 2 contains the percentages of inappropriate behavior for each subject during baseline. Column 3 is the percentages of inappropriate behavior during intervention. Thirty of the 31 subjects were inappropriate behavers less than 15% of the time during intervention. Column 4 contains the data for the first generalization check, generalization across conditions. Eight of the 10 subjects observed had mean inappropriate percentages less than 15%. Nine subjects were observed in the initial generalization over time category, with six of these subjects maintaining below the 15% level. The final observation category was an end-of-year check, which was a generalization over time observation carried out during the last three weeks of the school year on 25 of the 31 subjects. Twenty of the 25 subjects who received this five-consecutive-day observation showed mean levels of inappropriate behavior less than 15%.

Discussion

The present findings indicate that a strategy in which a behavior modifier carries out the initial difficult stages in a behavior change program and asks the teacher to carry out a second, maintenance program can be effective in producing long-term behavior changes. The generalization over time observations apparently indicate enhanced teacher participation as a result of the first step in the program being performed by a behavior modifier. Patterson's findings that long-term behavior change could be effected are confirmed by the present study. The generalization data indicates that a minimal teacher program can support the appropriate behavior of formerly disruptive children after one to two weeks of direct intervention. The durability of this behavior, as suggested by the end-of-year check, is quite good. The ease of maintaining former disruptive students' appropriate behavior without involved systems such as token economies underscores the appropriateness of the Patterson direct intervention strategy. No more than three of the 25 different teachers who were worked with during the school year carried out systematic behavior control programs such as token systems as follow-up to the behavior modifier's direct intervention. Apparently, the graphic evidence presented by the behavior modifier to the classroom teacher was enough to prompt the teacher to consequate appropriate behaviors on the part of the target students with greater frequency after the direct intervention. The demonstration that the students could respond appropriately by the dramatic decreases in inappropriate behavior graphically shown to the teacher was effective as a prompt for the teacher's appropriate behavior.

This strategy would be a particularly valuable one for school psychologists. They traditionally have no line authority over teachers to assign them the

responsibility of using operant strategies with disruptive students. They also seldom have reinforcers like college credit or the chance to participate in research which they can offer the classroom teacher. The usual reinforcer is the assurance that student change will occur if they follow a set of procedures. With this strategy, the graphic evidence of their former disruptive students' behavior may reinforce the teacher's part in this direct intervention phase and prompt them to carry out the maintenance program.

References

Kunzelman, Harold P., Cohen, Marilyn A., Hulten, William J., Martin, Grant L., Mingo, Ann R., Precision Teaching. Special Child Publications, Inc., 1970.

Patterson, G. R., Cobb, J. A., and Ray, R. S., Direct Intervention in the Classroom: A Set of Procedures for the Aggressive Child. Banff 3: Implementing Behavioral Programs for Schools and Clinics, 1972, 151-201.

Table 1

NO-COST CLASSROOM REINFORCERS

1. Lunch line position
2. Committee work
3. Extra Recess
4. Writing on board (scribbling (arts (games
5. Coloring, art work
6. Reading material (comic books, Magazines--student donated)
7. Home (parent) provided reinforcer
8. Notes to office
9. Clean boards
10. Watering plants
11. Feeding animals (fish, rats, hampsters, birds)(Kids brign own)
12. Helping teacher
13. Free time--5, 10, 15, 20, 25, 30 min.
14. Working together
15. Shop time 30 minutes
16. Record playing/tapes
17. Drink without permission
18. Sargeant at arms
19. Models in room
20. Gum and candy
21. Popcorn and food
22. Pop
23. Stay after school
24. Check out tape player
25. Gym time (sports)
26. Motorcycle rides
27. Cooking
28. Coming early
29. Grade papers
30. Leave early (early dismissal--1, 2, 3, 5 minutes)
31. Lunch money to office
32. Bulletin board decorating
33. Empty wastebasket
34. Help janitor (clean up, etc.)
35. Lead pledge to flag
36. Select privilege for rest of class (high value)
37. Treats for class--student brings
38. Flag raising ceremony (outside)
39. Change seats
40. Clean boards
41. Look at grade books
42. Special projects
43. Use opaque projector
44. Bulletin boards
45. Sit in teacher's chair
46. Set up and run projector for class films

SELF-CONTRACT

Date

Self:

Other:

Goal:

Agreement

Self:

Others:

Consequences

Provided by Self:
(if contract is kept)

(if contract is broken)

Provided by Other:
(if contract is kept)

(if contract is broken)

Review Date

Signed:

Witness

TABLE 3

MEAN % INAPPROPRIATE BEHAVIOR

Subject	Baseline	Intervention	Gen. Across Conditions	Gen. Over Time	End-of-Year Check
1 C	20.2	0			13
2 C	19.8	9.8			18.2
3 C	54.6	3.6			
4 C	44.4	3.8			1.2
5 C	44.6	6.0	10.3		9.6
6 C	20	1.2			
7 C	11%	20%	3		2.4
8 AC	18.2	3.4		0	14.4
9 C	33.6	1.2			4.6
10 WB, C	17.4	0			0
11 CT, C	19.4	6.8			
12 WB	31%	3%	27	25	
13 AC	17%				29%
14 AC	17%				56%
15 AC, CT	32.8	2.8	30.5		47.6
16 AC	17				4.8
17 WB, C	26.2	0	5.3	4.0	6.0
18 C	56.4	6.1		3.6	
19 C	31.8	3.0	10.9	16	10.8
20 C	55	.9			4.8
21 CT	27	.9	11.3		3.4
22 C	29	4.2			1.2
23 WB	26.7	5	8.2		0
24 OT	42.3	4.4			
25 WB, C	30.8	10.7			3.6
26 C	42.0	4.6			1.2
27 WB	56	1			
28 WB, C	25.8	4.5	9.5	0	5.8
29 C	16	3.6		2	17.4
30 C, CT	32	1.3		0	0
31 WB	20.6	6.8	6.9		14
32 C	19.8	2.2		14	9.4
33 WB	13.8	6.8			
34 C	13.8	5.8			
	$\bar{X}$=29%	$\bar{X}$=4.3%	$\bar{X}$=12.3%	$\bar{X}$=7.2%	$\bar{X}$=11.1%
	N=34	N=31	N=10	N=9	N=25
		14% or less=30	15% or less=8	15% or less =6	15% or less =20

WB = Workbox
C = Countoon
CT = Contract
OT = Omission Training
AC = Assignment Completion

TABLE 3A

MEAN % INAPPROPRIATE BEHAVIOR

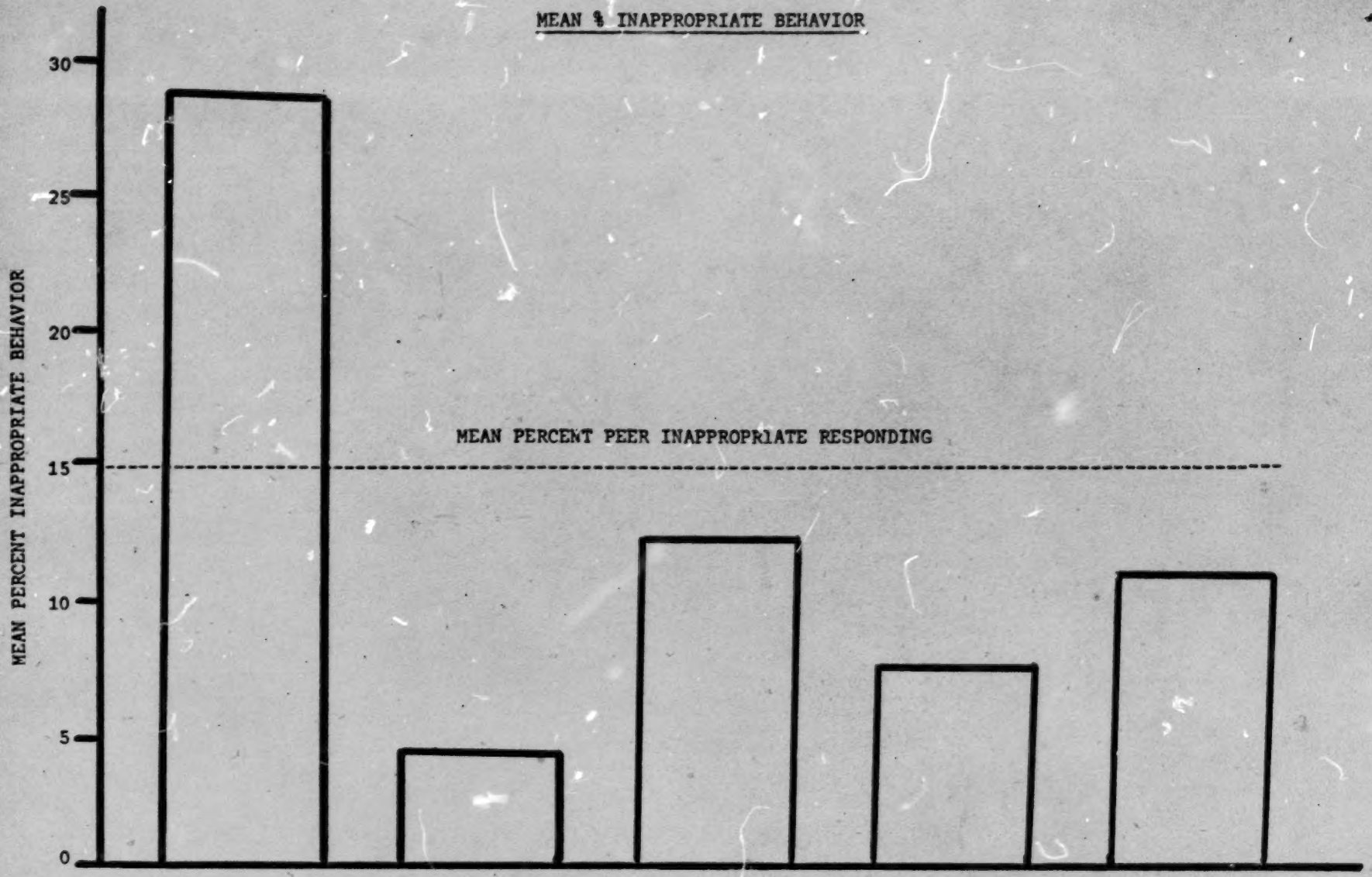

TABLE CAPTIONS

Table 1: A self-contract used with fourth and fifth graders for the maintenance program.

Table 2: A list of reinforcers compiled by students and teachers in Clarkston School District. Students chose the reinforcer they wanted to work toward from this menu.

Table 3: The type intervention and the % of inappropriate behavior for each condition measured. The mean % of inappropriate behavior for each condition, the total N for each condition, and the number of subjects who scored at or below the peer mean are presented at the bottom of each column.

Table 3A: A graphic display of the data from Table 3.